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**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Application Number: 09/398,253

Filing Date: September 17, 1999

Appellant(s): NEHLS ET AL.

Laura A. Coruzzi, Esq.
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed July 28, 2004.

(1) Real Party in Interest

A statement identifying the real party in interest is contained in the brief.

(2) *Related Appeals and Interferences*

Examiner notes that U.S. Application Serial Number 09/460,594, is related to the instant application in that the claims of the application is drawn to an isolated nucleic acid molecules derived from teratocarcinoma cells via use of gene trap vector technology, a recombinant vector comprising said isolated nucleic acid molecules, and a method of producing a polynucleotide. The applications are related in that the oligonucleotides/polynucleotide of the instant application and those of the 09/460,594 are derived from same technology, that is, through use of gene trap vectors from teratocarcinoma cells, whereas the only difference lies in their SEQ ID Numbers. On April 21, 2004, the board affirmed the Office's position in that the claimed nucleic acids lacked a substantial utility under 35 U.S.C. 101, and that claimed nucleic acids lacked enablement under 35 U.S.C. 112, first paragraph, as one skilled in the art would not know how to "use" the invention.

(3) *Status of Claims*

The statement of the status of the claims contained in the brief is correct.

(4) *Status of Amendments After Final*

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) *Summary of Invention*

The summary of invention contained in the brief is correct.

(6) *Issues*

The appellant's statement of the issues in the brief is correct.

(7) *Grouping of Claims*

Appellant's brief includes a statement that claims 1, 3, 4, 10, and 12 do not stand or fall together and provides reasons as set forth in 37 CFR 1.192(c)(7) and (c)(8).

(8) *ClaimsAppealed*

The copy of the appealed claims contained in the Appendix to the brief is correct.

(9) *Prior Art of Record*

No prior art is relied upon by the examiner in the rejection of the claims under appeal.

(10) *Grounds of Rejection*

The following ground(s) of rejection are applicable to the appealed claims:

Claims 1, 3, 4, 10, and 12 are rejected under 35 U.S.C. 101 because the claimed invention is not supported by either a specific, substantial, and credible asserted utility or a well established utility.

The claimed subject matter is not supported by a specific, substantial, and credible utility because the disclosed uses are generally applicable to broad classes of this nucleic acid molecule subject matter. In addition, further characterization of the claimed subject matter would be required to identify or reasonably confirm a "real world" use. The examiner does not find an adequate nexus between the evidence of record and the asserted properties of the claimed nucleic acid molecule subject matter.

Claim 1 is drawn to an oligonucleotide derived from teratocarcinoma cells via use of gene trap vectors, wherein said oligonucleotide comprises a contiguous stretch of at least about 30 nucleotides of at least one of SEQ ID Numbers 9, 10, 12, 13, 17, and 18.

Claim 3 is drawn to an isolated polynucleotide derived from teratocarcinoma cells via use of gene trap vectors, wherein said oligonucleotide comprises a contiguous stretch of at least about 60 nucleotides of at least one of SEQ ID Numbers 9, 10, 12, 13, 14, and 16-18.

Claim 4 further limits claim 3, requiring said polynucleotide to comprise at least one of SEQ ID Numbers 9-18.

Claim 10 is drawn to an oligonucleotide comprising a contiguous stretch of at least about 20 nucleotides of SEQ ID Number 16.

Claim 12 is drawn to an isolated polynucleotide consisting essentially of a contiguous stretch of at least about 125 nucleotides of SEQ ID Numbers 11 or 15.

The specification identifies the nucleic acids of SEQ ID Numbers 9-18 as being derived from pools of modified human PA-1 teratocarcionma cells via use of a retroviral vector (page 75, lines 1-15). The specification identified SEQ ID NOS: 9-18 as being a chimeric transcript which is produced by a fusion between a first exon of the transgenic construct and downstream exons from the cellular genome (page 75, lines 9-11).

SEQ ID Number 9 is 171 nucleotides in length. SEQ ID Number 10 is 294 nucleotides in length. SEQ ID Number 11 is 241 nucleotides in length. SEQ ID Number 12 is 197 nucleotides in length. SEQ ID Number 13 is 387 nucleotides in length. SEQ ID Number 14 is 326 nucleotides in length. SEQ ID Number 15 is 166 nucleotides in length. SEQ ID Number 16 is 638 nucleotides in length. SEQ ID Number 17 is 403 nucleotides in length. SEQ ID Number 18 is 103 nucleotides in length.

No open reading frame, start/stop codons, or encoded protein is identified in the specification for any SEQ ID NO. No specific biological function is asserted for any protein

encoded by any SEQ ID NO. Therefore, one of ordinary skill in the art would clearly have reason to doubt that SEQ ID Numbers 9-18 were full length based upon the short length of the claimed SEQ ID NOS.

There is no other particular identifying information associated with any SEQ ID NO other than the fact that the sequences are derived from teratocarcinoma cells and that because teratocarcinoma cells are totipotent, they would represent a good model for molecular mechanisms of embryonic development and differentiation (page 3, 2nd paragraph; Brief). The specification does not list any potentially homologous prior art sequences for any SEQ ID NO.

General uses of polynucleotides set forth in the specification, as filed, include acquiring full-length genes, homologs, heterologs, paralogs, or orthologs (page 2, line 17), and probes. (see at least pages 3-4.) None of these is considered to be specific and substantial in view of the limited information provided in the specification. No traits are attributed to any SEQ ID NO. No complete gene is disclosed for any SEQ ID NO.

Further research and experimentation would be required to identify a full-length sequence that encoded a full-length protein, to characterize the chromosomal location, and to determine any associated traits. Identifying and studying the properties of the claimed subject matter itself or the mechanisms in which the claimed subject matter is involved does not define a "real world" context or use.

These uses require that the claimed nucleic acid molecules be usable as a laboratory reagent. Laboratory reagents must be sufficiently characterized and their properties understood to be used in these types of methods. In the absence of such characterization, no meaningful

information is provided. The claimed nucleic acid molecules are starting materials for further research and not research tools.

Claims 1, 3, 4, 10, and 12 are also rejected under 35 U.S.C. 112, first paragraph. Specifically, since the claimed invention is not supported by either a credible, specific, and substantial asserted utility or a well established utility for the reasons set forth above, one skilled in the art clearly would not know how to use the claimed invention.

Claims 1, 3, 4, 10, and 12 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. This is a written description rejection.

Claims 1, 3, 4, 10, and 12 are directed to an oligonucleotide or an isolated polynucleotide “comprising.” The specification fails to describe any open reading frames, start/stop codons, or encoded proteins for any SEQ ID NO. As such, these nucleic acid molecules are not described. At best, the SEQ ID NOS. may include a sequence encoding a fragment but not a full-length protein.

The use of the term “comprising” is interpreted to encompass full-length cDNA and gene sequences that have not been disclosed.

The specification describes only the particular SEQ ID NOS. and no longer sequences containing them. One can only envision the particular sequence disclosed and cannot envision any larger sequences in which the claimed SEQ ID NOS. are embedded.

(11) Response to Argument

Appellant's arguments are addressed *seriatum*.

Section 8A(1) – Specific Utility

Preliminarily, it should be noted that the claimed nucleic acids were rejected as lacking the substantial utility test. Appellants appear to suggest that the Office communication of record rejected the claimed nucleic acids under the basis of lacking specific utility "because" the nucleic acids did not have a substantial utility. It should be noted that the utility guidelines (available at <http://www.uspto.gov/web/menu/utility.pdf> and chapter 2107 of MPEP) makes clear that there is a four-prong test for determining whether or not a claimed invention has a patentable utility. The specific utility and the substantial utility are separate tests and the Office communications (as discussed below) will make clear that the nucleic acids failed to satisfy the substantial utility test.

Appellants state that the examiner based the rejection of the claims on the contention that the disclosed uses of the nucleic acid are not specific and are generally applicable to any nucleic acid and that the Advisory Action dated January 30, 2004 contended that, "the invention [did] not have a specific utility because the claimed nucleic acids and oligonucleotides lack a substantial, immediately apparent utility (page 6, Brief).

It appears that Appellants have misinterpreted what was communicated on said Advisory Action. In that action, Appellants were advised of the following:

"Applicants argue that the claimed polynucleotide are specific because the claimed polynucleotides were specific to the site of teratocarcinoma cells. Applicants also argue that the claimed nucleic acids have specific utility because they can be used to identify and study genes that are involved in the late stages of stem cell differentiation and development (pp. 4). Applicants then state that an understanding of molecular mechanisms which govern stem cell fate is therefore of fundamental significance in cell and developmental biology and the capabilities arising from such knowledge have major biomedical applications (pp. 4). These

points are not found persuasive because although the claimed nucleic acids might be specific to the site of expression (or extraction), the claimed nucleic acids lack a substantial utility." (Advisory Action, at page 2)

It is clear from the context of the Advisory Action, that the contention was not whether or not the utility argued by Appellants was specific – as the action recites, “the claimed nucleic acids might be *specific to the site of expression (or extraction)*,” – but that the invention did not have a substantial utility.

Therefore, to state that the office communication stated that the invention lacked a specific utility “because” it didn’t have a substantial utility is not a correct interpretation. In fact the phrase, “invention does not have a specific utility because the claimed nucleic acids and oligonucleotides lack a substantial, immediately apparent utility” is nowhere to be found in any of the Office communications.

To reiterate, the above section of the Advisory Action was clear in communicating that the claimed invention lacked patentable utility due to its not being supported by a substantial utility, one of the utilities defined in the utility guidelines available at:

<http://www.uspto.gov/web/menu/utility.pdf>.

With regard to Appellants’ argument stating that the Examiner did not address whether the arguments presented by Appellants regarding specific utility are persuasive, the Office action communicated that all nucleic acids “might be specific to the site of their expression.” (page 2, Advisory Action, *ut supra*). In other words, all nucleic acid molecules are specific in sense that they are specific to their complementary sequence (*i.e.*, they hybridize to each other). What was in contention was whether the claimed nucleic acids had substantial utility.

Appellants next summarize the technique through which the claimed nucleic acids are derived (page 7, Brief). The technique involves the use of a gene trap vector which are

introduced into human teratocarcinoma cell, wherein the vector integrates into the cells genome resulting in gene fusions. The exons identified by this process are portions of genetic locus that were disrupted by the gene trap vector, but those which did not critically affected the survival of the teratocarcinoma cells, postulating that the identified sequences play a role in the “later stages of cellular differentiation.” (pages 7-8, Brief).

Thus, Appellants conclude that the polynucleotide or oligonucleotide can be, “used as a gene probe or chromosome marker *specific* for such genes that are of particular interest to scientists and medical practitioners studying the biology of cellular differentiation and development.” (page 9, 2nd paragraph, Brief).

Appellants also state that the Office Action dated July 2, 2003 stated that neither the specification nor the response disclosed any associated phenotypes for the claimed polynucleotides (page 9, 3rd paragraph, Brief). The section of the above Office Action which discusses the above statement is produced below:

“Although Applicants assert that the gene trap method allows one to identify genes that do not have an **easily observable phenotype** (page 4, middle paragaph), neither the specification nor the response disclose any associated phenotypes for the claimed polynucleotides. Additionally, Applicants argue it is not necessary to disclose what roles SEQ ID Numbers 9-18 play in the later stages of cellular differentiation and development in order to satisfy the specific utility requirement because the claimed oligonucleotides or polynucleotides of the present invention is not just any piece of nucleic acid (page 4, bottom), thereby satisfying the specific utility requirement. To this end, all nucleic acids are specific to their complements. In other words, for example, a piece of nucleic acid isolated from a brain cell would be specific to its complement. However, 35 USC 101, requires that the specification disclose at least one utility that is specific and substantial, as well as credible (absent a showing of well established utility, which would presume that the utility was credible). The claims have been rejected because the

specification failed to disclose at least one utility that is substantial." (emphasis added, page 3, 2nd paragraph to page 4)

Again, the above section of the Office Action, when read in context, is clear that the point of contention was whether or not the claimed nucleic acids had a substantial utility.

Appellants refer to the Office Action mailed on November 5, 2002, stating that the Office Action alleged that, "Appellants has [sic] not disclose [sic] what roles do SEQ ID Numbers 9-18 play in the later stages of cellular differentiation and development," (page 10, 2nd paragraph, Brief) starting that "it is not necessary to disclose what such roles are in order to satisfy the specific utility requirement." (page 10, 2nd paragraph, Brief)

Again, this is a misinterpretation of the Office Action.

The section to which Appellants discuss is produced below:

"It appears that whether the sequences set forth in SEQ ID Nos: 9-18 actually play a role in the later stages of cellular differentiation and development is a speculation based on the fact that the cells containing such disruptions were viable regardless. The specification makes no disclosure of evidence disclosing such assertion. Even if Applicants' assertions were true in that the sequences set forth in SEQ ID Nos: 9-18 played a role in the later stages of cellular differentiation and development, Applicants have not disclosed what such roles were. It is clear that the claimed sequences do not have a substantial utility because the sequences are not "refined and developed to this point-where specific benefit exists in currently available form," requiring further experimentation of a skilled practitioner. As stated above, the court expressed that a patent, "is not a reward for the search, but compensation for its successful conclusion." Applicants have not arrived at such successful conclusion of how the claimed sequences are involved in the cellular differentiation and development, but rather arrived at a starting point of further research in determining how the claimed sequences are actually involved.

Applicants state that the Examiner of record appeared to contend (in the Advisory Action mailed on January 29, 2002) that the claimed nucleic acids do not have specific utility because the nucleic acids lack a substantial utility (pp. 8). Without acquiescing to the allegation, the statement addressed

the fact that although the claimed nucleic acids might be specific to their targets (as all nucleic acids are specific to their complements), the issue at hand was the fact that the claimed nucleic acids did not have a substantial utility." (page 4, 2nd paragraph to page 5, Office Action mailed on November 5, 2002).

Again, reading the above paragraph, in context, one would readily recognize that the Office Action was addressing the nucleic acids as lacking substantial utility.

On page 11, 1st paragraph of the Brief, Appellants state that the specification, at page 20, lines 12-15 describes that the claimed oligonucleotides or polynucleotides from the intron/exon boundaries of the human gene can be used to design primers for use in amplification assays to detection mutations within the exons, introns, splice sites that can be used as diagnostics.

Appellants continue by stating that, "only a small percentage (2-4%) of the human genome actually encode exon sequences, and these exons are widely interspersed within a given chromosome, which goes through post transcriptional modification, concluding that the claimed oligonucleotides or polynucleotides comprising SEQ ID Numbers 9-18 encode exons that are actually spliced together to produce an active functional transcript.

To this end, any ESTs (expressed sequence tags) would necessarily have the same characteristics, as they are expressed in the human genome, but absent an immediately apparent use, as expressed by the court in *Brenner v. Manson*, 148 USPQ 689 (1966) -- wherein the court expressed the opinion that all chemical compounds are "useful" to the chemical arts when this term is given its broadest interpretation, but stating that this broad interpretation was not the intended definition of "useful" as it appears in 35 U.S.C. 101, which requires that an invention

must have either an **immediately apparent** or fully disclosed “real world” utility (emphasis added) – the nucleic acids would lack a substantial utility.

On page 12, 2nd paragraph of the Brief, Appellants state that the gene trapped sequences of the present invention overcome some of the limitation of conventional cDNA and EST libraries in that it is able to trap poorly expressed genes. However, the instant claims are not drawn to a technique of gene trap, but the product produced by this method. Secondly, the specification does not substantiate whether the claimed nucleic acids are poorly expressed. Thirdly, whether poorly expressed or normally expressed, the claimed invention must satisfy the requirements under utility, and it is determined that the claimed nucleic acids lack a substantial utility.

With regard to the claimed nucleic acids being located on some chromosome (page 13, 2nd paragraph, Brief), all expressed sequences will be located on some chromosome, but absent a substantial utility, the utility criteria under 35 U.S.C. 101 is not satisfied. Additionally, the specification fails to demonstrate how the mapping of the claimed polynucleotides are any different from the mapping of any ESTs. Clearly, the claimed polynucleotides do not have substantial utility.

Appellants state that the present oligonucleotides or polynucleotides are specific markers of the human genome (page 13, bottom paragraph) and such specific markers are targets for discovery of drugs that are associated with human disease, and as such, those of skill in the art would instantly recognize that the present nucleotide sequence would be an ideal, novel candidate for assessing gene expression.

This argument is no different than stating that any expressed nucleic acids could be used as specific markers (as they are specific to their complementary sequences) and not just the claimed nucleic acids. However, the question of substantial, “immediate apparent,” utility has yet to be answered.

Section 8A(2) – Substantial Utility & Credible Utility

Appellants contend that an invention nevertheless has substantial utility, “even though further research needs to be performed.” (page 15, 1st paragraph, Brief). Appellants give as an example, “an assay method for identifying compounds that themselves have a ‘substantial utility’ define a ‘real world’ context of use.” (page 15, 1st paragraph, Brief).

It should be noted that the claims under appeal are not drawn to a method, but rather a product.

Appellants state that an assay that measures the presence of a material which has a stated correlation to a predisposition to the onset of a particular disease condition would also define a “real world” context of use in identifying potential candidates for preventive measures or further monitoring, citing MPEP 2107.01 (page 15, 1st paragraph, Brief; emphasis added).

This statement is followed by Appellants’ argument, “among other uses, the polynucleotides of the present invention may be used in the context of a hybridization assay, e.g., in the format of a microarray” without giving any “correlation to a predisposition to the onset of a particular disease condition,” to which Appellants rely on to demonstrate substantial utility. Neither the specification nor the Appellants’ responses give any evidence, which correlates the claimed polynucleotides/oligonucleotides to a “particular disease condition.”

Therefore, Appellants' own example fails to support that the claimed polynucleotides/oligonucleotides' substantial utility.

Appellants state that instead of using the entire universe of genes in the genome in such an experiment, the skilled person has the option of limiting the experiment to using polynucleotides of the invention in the microarray, thus in effect, excluding genes that are critically essential to the survival and early growth of teratocarcinoma cells from the microarray (page 15, 2nd paragraph, Brief), concluding that, further research is not performed to identify or reasonably confirm the asserted utility but to state a correlation between a gene and a particular state in cellular differentiation and development.

It should be noted that there are no clear evidences (in the specification or Appellants' responses) that the claimed nucleic acids "are" indeed involved latter cellular differentiation and development. The only evidence the specification has is that the claimed nucleic acids were not critical in the survival of teratocarcinoma cells. Whether or not the claimed nucleic acids are indeed involved in cell differentiation and development is a pure speculation based on the above finding.

As to Appellants' argument, such argument is no different than stating that a group of nucleic acids isolated from a bladder would have substantial utility as a microarray, because further research is not performed to identify or reasonably confirm that such nucleic acids could be used to study gene expression in bladder.

In both situations, whether or not the such nucleic acids would have a substantial use would only be answered after "further research" has been conducted.

In *Brenner v. Manson*, 148 USPQ 689 (1966), the court expressed the below:

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"The basic quid pro quo contemplated by the Constitution and the Congress for granting a patent monopoly is the benefit derived by the public from an invention with substantial utility...[u]nless and until a process is refined and developed to this point-where specific benefit exists in currently available form there is insufficient justification for permitting an appellant to engross what may prove to be a broad field...a patent is not a hunting license...[i]t is not a reward for the search, but compensation for its successful conclusion.

The court clearly expressed that patent is for a successful conclusion, not a reward for the search.

This is consistent with the utility guidelines set forth by the U.S. Patent and Trademark

Office:

"Substantial utility" - a utility that defines a "real world" use. Utilities that require or constitute carrying out further research to identify or reasonably confirm a "real world" context of use are not substantial utilities. For example, both a therapeutic method of treating a known or newly discovered disease and an assay method for identifying compounds that themselves have a "substantial utility" define a "real world" context of use. An assay that measures the presence of a material which has a stated correlation to a predisposition to the onset of a particular disease condition would also define a "real world" context of use in identifying potential candidates for preventive measures or further monitoring. On the other hand, the following are examples of situations that require or constitute carrying out further research to identify or reasonably confirm a "real world" context of use and, therefore, do not define substantial utilities":

- A. Basic research such as studying the properties of the claimed product itself or the mechanisms in which the material is involved.
- B. A method of treating an unspecified disease or condition. (Note, this is in contrast to the general rule that treatments of specific diseases or conditions meet the criteria of 35 U.S.C. § 101.)
- C. A Method of assaying for or identifying a material that itself has no "specific and/or substantial utility".
- D. A method of making a material that itself has no specific, substantial, and credible utility.
- E. A claim to an intermediate product for use in making a final product that has no specific, substantial, and credible utility.

As already discussed above, an assay that measures the presence of a material which has a stated correlation to a predisposition to the onset of a particular disease condition would define a "real world" context of use in identifying potential candidates for preventive measures or further monitoring, (page 15, 1st paragraph, Brief; emphasis added), but Appellants fails to identify what that particular disease is. Therefore, at best, the claimed nucleic acids would fall

under the situation (B) above, wherein the situation states that a method of treating an unspecified disease or condition,” requiring further experimentation.

Additionally, with regard to Appellants’ arguments drawn to microarrays, absent a substantial utility, Appellants’ microarray would only be useful for basic research to study the properties of the claimed products, so that a substantial utility could be identified.

Finally, Appellants’ discussion with regard to an invention nevertheless having substantial utility, “even though further research needs to be performed.” (page 15, 1st paragraph, Brief) must be clarified. It appears that the phrase that Appellants are paraphrasing is from *In re Brana*, (51 F.3d 1560, 34 USPQ2d 1436, Fed. Cir. 1995), wherein the court expressed that an FDA approval is not a prerequisite for finding a compound useful within the meaning of the patent laws and usefulness in patent law **necessarily includes the expectation of further research and development,**

However, in order to understand why the court expressed this statement, the entire fact pattern must be analyzed.

First of all, it is important to note that the courts’ statement was with regards to a “pharmaceutical invention.”

The background of *In re Brana* is iterated below:

Applicants (Brana et al.) filed patent application directed to 5-nitrobenzo [de]isoquinoline-1,3-dione compounds, for **use as antitumor substances.** (emphasis added) The specification stated that based on a computer-assisted evaluation of benzo [de]isoquinoline-1,3-diones and related compounds which have been screened for antitumor activity by testing their efficacy *in vivo* against two specific implanted murine

(i.e., utilizing mice as test subjects) lymphocytic leukemias, P388 and L1210, [de]isoquinoline-1,3(2H)dione,5-amino-2(2-dimethyl-aminoethyl [sic])(hereinafter "NSC 308847"), was found to show excellent activity against these two specific tumor models (1438-1439). The Applicants' claimed compound was disclosed as being "structurally similar" as well as showing good result in antitumor activity against human tumor cells (1438). Applicants even submitted a Declaration by Dr. Kluge demonstrating that the claimed compound exhibited significant antitumor activity against tumor (page 1442).

Court decision was based on the fact that the prior art as well as the specification and declaration provided evidence that one skilled in the art would be convinced of the applicants' asserted utility. The evidences in this case were clearly substantive and specific. The compound was demonstrated as being useful in having an antitumor activity. The specification disclosed the structural similarities between the claimed compound and the compound known to have antitumor activity. Additionally, the Declaration of Dr. Kluge demonstrated a substantial and specific utility by showing that the claimed compound had significant antitumor acitivity.

Appellants' disclosure is not analogous to the disclosure provided in *In re Brana*. The instant specification does not disclose any utility of the claimed polynucleotides other than uses that are generically applicable to any nucleic acid. For example, Appellants argue that the claimed polynucleotide would be useful as a probe. However, any piece of nucleic acid, by place of its isolation, is specific to its complement. Further, a sense strand of the nucleic acid would hybridize to its substantial complement (or anti-sense). These are inherent properties of a nucleic acid. However, no specific nor substantial utility is gleaned form this fact alone. Such

hybridization must infer an immediate, substantial utility. Such utility, for example, is a cancer marker probe.

When the court expressed that a FDA approval is not a prerequisite for finding a compound useful within the meaning of the patent laws and usefulness in patent law necessarily includes the expectation of further research and development, court was stating that the pharmaceutical composition need not be ready **for human consumption** (through experimentation) to have a patentable utility.

Such finding is nowhere evident in the present specification. The specification asserts that the claimed polynucleotides would have utility because they could be used as probes. However, the specification is silent in what information a skilled artisan could obtain from the use of the probe other than knowing that it was present. Simply assuming that probes have been patentable in the art and since the claimed polynucleotides, by virtue of inherent property, could be used as probes, must be patentable is not a proper understanding of 35 U.S.C. 101.

Section 8(B) – Enablement

Appellants state that claims 1, 3, 4, 10, and 12 were rejected under 35 U.S.C. 112, first paragraph “as allegedly lacking utility.”

While the claims were rejected under 35 U.S.C. 112, first paragraph, the claims were rejected as failing to enable a skilled artisan in showing how to use the invention (*i.e.*, enablement rejection) within 35 U.S.C. 112, first paragraph, as there is no patentable utility within 35 U.S.C. 101. The Examiner maintains that there is no patentable utility for the claimed invention for the reasons set forth above and thus the claims are not enabled.

Section 8(C) – Written Description

The issue is whether Appellants were in possession of the genus being claimed. This genus is not restricted to any particular disclosed subgenus or species, such as vectors comprising any of SEQ ID Numbers 9-18 as an insert. The only nucleic acid molecules described by complete structure are those consisting of any of SEQ ID Numbers 9-18. The only nucleic acid molecules comprising any of SEQ ID NOS: 9-18 described in the specification by other characteristics are generic vectors comprising any of SEQ ID Numbers 9-18. While it is acknowledged that Appellant need not describe “every nuance” of the claimed invention, the written description must bear a reasonable correlation to that which is claimed. The disclosed subgenus and species embraced by the claims are not representative of the entire genus being claimed. The genus of nucleic acid molecules being claimed embraces any and every type of nucleic acid molecule that comprises any of SEQ ID Numbers 9-18, and additional sequences of any size and sequence, not just vector backbones. Clearly, at the time of filing, Appellant was not in possession of genomic materials that contain the claimed nucleic acid fragment, which are embraced by the open-ended claims. The specification does not disclose what characteristics these additional sequences may or may not have that are consistent with the operability of the nucleic acid molecules as probes or primers for detection of SEQ ID Numbers 9-18 in a target sequence, and all disclosed uses for the claimed nucleic acid molecules are fundamentally as probes or primers, at least in some aspect. The specification does not disclose encoding sequences or open reading frames (ORFs).

With respect to full length mRNAs, cDNAs and genomic sequences, one skilled in the art would reasonably conclude that the claims embrace these nucleic acid molecules, and the

specification provides no physical (i.e. structural) characteristics of these molecules to distinguish them from other nucleic acid molecules comprising any of SEQ ID Numbers 9-18, and no other indication that would suggest Appellant possessed them. This particular subgenus embraced by the claims has a disclosed potential utility not possessed by those members of the claimed genus useful only in hybridization. Full length mRNAs, cDNAs and genomic sequences (genes) would encode the corresponding protein(s).

A fundamental issue here is specific to the very narrow class of product that is nucleic acid molecules. The basic question upon which Appellants and the Examiner disagree is whether the disclosure of a partial sequence of otherwise uncharacterized nucleic acid molecules that may encode a corresponding protein is sufficient to establish possession of a broad genus based solely on the description of the partial sequence, where the broad genus embraces the uncharacterized nucleic acid molecules by default. The subgenus of uncharacterized nucleic acid molecules that encode any corresponding protein is explicitly alluded to in the specification, and disclosed as possessing an additional use *not* possessed by any other members of the broad genus being claimed, i.e. encoding the protein. The specification fails to provide any structural or functional characteristic for these desired nucleic acid molecules, which encode the protein, that would distinguish them from the other members of the genus, which simply comprise any of SEQ ID Numbers 9-18 as the sole distinguishing feature. As stated in *University of California v. Eli Lilly and Co.* at page 1404:

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An adequate written description of a DNA ... "requires a precise definition, such as by structure, formula, chemical name, or physical properties," not a mere wish or plan for obtaining the claimed chemical invention. *Fiers v. Revel*, 984 F.2d 1164, 1171, 25 USPQ2d 1601, 1606 (Fed. Cir. 1993). Accordingly, "an adequate written description of a DNA requires more than a mere statement that it is part of the invention and reference to a potential method for isolating it; what is required is a description of the DNA itself." *Id.* at 1170, 25 USPQ2d at 1606.

That Appellants claims embrace nucleic acid molecules that encode a corresponding protein, whatever it may be, is clearly evident from the claim language chosen. The Court in *University of California v. Eli Lilly and Co.*, at page 1405, further noted regarding generic claims:

A written description of an invention involving a chemical genus, like a description of a chemical species, "requires a precise definition, such as by structure, formula, [or] chemical name," of the claimed subject matter sufficient to distinguish it from other materials. *Fiers*, 984 F.2d at 1171, 25 USPQ2d at 1606; *In re Smythe* , 480 F.2d 1376, 1383, 178 USPQ 279, 284-85 (CCPA 1973) ("In other cases, particularly but not necessarily, chemical cases, where there is unpredictability in performance of certain species or subcombinations other than those specifically enumerated, one skilled in the art may be found not to have been placed in possession of a genus. . . .").

In the instant case, the only species specifically enumerated are the nucleic acid molecules of SEQ ID Numbers 9-18 themselves. The specific embodiments that in addition to SEQ ID NO: 9-18 include nucleic acids that will allow the corresponding protein to be encoded cannot be predicted without the coding sequence itself. This coding sequence has not been disclosed. Clearly, the specification would not show one skilled in the art that these desired subcombinations were possessed by Appellant, and thus the embracing genus was also not possessed.

For the above reasons, it is believed that the rejections should be sustained.

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Respectfully submitted,

Young J. Kim



10-19-04

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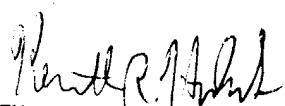
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